

well be content to linger in the rich and pleasant pasturage in which we encountered it.

I may add that our observations were confined almost entirely to the grassy and flowery borders of the road, and that the swarm which excited our wonder was probably only a single column of a countless host.

THOMAS HINCKS

Budleigh-Salterton, September 2

"Rag-Bushes" 1

A REMARKABLE instance of this custom existed (I am referring to twenty-five years ago) in Ceylon. On the West Coast, on the road between Chilaw and Jaffna, at a place—the name of which, after so many years' absence, I forget—was a vast collection of rag-offerings suspended to the bushes through which the road was cut. It went by the name of "Rag Fair," with those of us who had travelled in that direction: there were miles of it. They were said to be offerings to the goddess "Kali" (who, in the midst of them, had a temple and *well*), to propitiate her and obtain her protection against the dangers of the way, especially those of wild beasts.

Once travelling up that road, my horsekeeper, "Multu," watered my horse at the sacred well. Out rushed the priest, furious with wrath, and cursed Multu with all the vengeance of "Kali," assuring him that he would be eaten by leopards that very night.

Multu, who, I fear, was an atheist after his kind, merely laughed at the offended guardian of the shrine, and pointing to my rifle lying in the hollow of his arm, told him that while the master or himself carried *that*, he did not care a copper "chailly" (a "brass farden," vernacular) for "Kali," the leopards, or himself.

I soothed the irate old humbug by hanging a strip of rag, which I carried in my pocket for gun-cleaning, on a branch, but especially with a trifling bit of silver—I believe this latter portion of an offering is usually, with miracle- and charm-makers, the most efficacious—and went my way.

Multu had his triumph that night. A wretched coolie travelling along the road—one of the class that supply the chief abundance of the rags—after hanging up his offering and doing "pooja," was, while sleeping in the "maddam," or porch of the temple, of his protecting goddess, actually seized and carried off by a leopard. He was rescued—how, I forget—and brought to the "Rest-house" where I was, but was so dreadfully lacerated about the hips and lower portion of the body that he died in a few hours.

E. L. LAYARD

British Consulate, Noumea, July 5

Signalling by Sunshine 2

THOUGH I fear by the time this reaches you the subject will have been exhausted, I send you this "note;" you can but blow it into the paper-basket if not wanted.

While at the Cape of Good Hope, my dear old friend Sir Thomas Maclear, then Astronomer-Royal, told me that while measuring the arc of the meridian to verify Lacaille's work, he signalled with the heliostat enormous distances, the clear atmosphere of the Cape being eminently adapted for the purpose. If my memory does not play me false, I think he said one station in connection with his cairn on the top of Table Mountain (3,800 feet) was ninety-five miles distant.²

His means of directing the flash was as follows:—A tiny hole is scratched in the quicksilver in the centre of the heliostat, and a board with a larger hole is planted in front of the station, some few feet from the instrument.

The corresponding station is brought in view through the two holes, and all three are consequently "in line." The flash is then directed through the hole in the board, and is thus sent straight to the desired point. Of course telescopes were used for long distances.

Another old friend, Admiral Trotter, used to converse from Admiralty House, Simon's Bay, with friends staying at "Kalk" Bay, some eight or nine miles distant.

E. L. LAYARD

British Consulate, Noumea, July 4

¹ NATURE, vol. xx, p. 595.

² NATURE, vol. xx, p. 508.

³ An amusing coincidence may be noted here. I was returning from Graham's Town by a steamer, and when we came in sight of the old mountain, I happened to mention Sir Thomas's signalling. My hearers on board jeered at the possibility of making signals with "a piece of looking-glass," when suddenly we were half blinded by a flash of light from the top of the mountain. "What on earth is that?" was the general exclamation! "Only Sir Thomas signalling," was my triumphant reply, "Perhaps you will some of you now believe in a 'bit of looking-glass.'" Sir Thomas's son had, for fun, sent a flash or two down to the steamer.

Bag-like Fabrication exhibited by Sir Sydney Saunders

As much the "production of a large species of spider in Fiji" as a lady's silk dress is the "production" of a worm in China!

A large spider, of a genus common all over Polynesia, and here also in New Caledonia (where formerly much eaten by the aborigines) produces a very strong, thick web. On Sundays generally, when no work is going on in the plantations, the imported Pacific Islanders amuse themselves by wandering about the bush, armed with a frame-work of cane in the shape of an elongated cone, affixed to a long stick. This they twist and twist, round and round in the spiders' webs, till it is coated, sometimes half an inch thick, with the viscous fabric. They then untie the fastenings and draw out the strips of cane, when the bag becomes like a long night-cap (old pattern). I have one before me now, over a yard long, a foot across, and pretty thick, which does not weigh one ounce! It is yellow; the New Caledonian ones are usually grey. I do not think the Fijian natives had the custom originally. Some of the New Caledonian are stretched tight enough to resemble an Indian suspension "tom-tom," and really emit a slight sound on being "tapped." This will give some idea of the strength of the thread, for which see also *The Field* ("My Trip to Lifu"), wherein I notice the impromptu butterfly nets made by some boys stretching the web of this spider across the loop of a bent twig.

E. L. LAYARD

British Consulate, Noumea, July 5

Observations on a Wind-Whirl

WHILE making magnetic determinations at Schell City, Mo., a wind-whirl of some violence passed near our tent, moving with the characteristic swaying and halting motions of the tornado. Its base was quite pointed, and about two feet in diameter.

Unlike those seen last year, and described in NATURE about a year ago, there were no surface-winds strong enough to bear dust along the surface of the ground, but the dust carried up in the vortex was collected only at the vertex of the whirl. The dust column was about 200 feet high, and perhaps 30 or 40 feet in diameter at the top. The direction of rotation was the same as that of storms in the northern hemisphere. Leaving the road, the whirl passed out on the prairie, immediately filling the air with hay, which was carried up in somewhat wider spirals, the diameter of the cone thus filled with hay being about 150 feet at the top. It was then observed, also, that the dust column was hollow. Standing nearly under it, the bottom of the dust column appeared like an annulus of dust surrounding a circular area of perfectly clear air. This area grew larger as the dust was raised higher, being about 15 or 20 feet wide when it was last observed. This whirl could be observed half a mile, finally disappearing over a hill.

This observation, in connection with the one given by me a year ago, has a very important bearing on the theory of "waterspouts" and tornadoes.

FRANCIS E. NIPHER

St. Louis, Mo.

Transportation of Seeds

IN a recent number of NATURE which has lately reached my hands, I observe a letter from Consul Layard on the above subject, to which let this note be an addendum.

In my daily expeditions I am exceedingly troubled by the seeds of the *Andropogon acicularis* (Retz), not only adhering on the slightest touch to my clothes, especially to my trousers and socks, to the daily annoyance and occupation of much of the time of my servant in their obstinate removal, but even penetrating my limbs and adhering there to my great discomfort, for the itching that they cause is sometimes intolerable; and my limbs consequently present somewhat the appearance of those of a scarlet-fever patient.

HENRY O. FORBES

Kesala, Bantam, Java, July

Shark's Teeth

I WOULD draw attention to the operation of the teeth of the shark on the seizure of its prey. I recollect in Nicholson's "Zoology," a statement to the following effect: "The sharks have teeth arranged in several rows, of which only the outermost is employed, the other rows seeming to replace the outermost when worn out." In a recent visit to the Cocos Islands I had many opportunities of observing these animals in the use of their formidable weapons. In the act of seizure the whole jaw is protruded to a distance (varying according to the size of the fish) of several inches, the innermost teeth coming into position erect

or semi-erect, but as far as I could observe nearly *all* the teeth came into play. When on fishing excursions in the lagoon, the sharks which constantly carried off the bait, were often caught, and in order to extract the hook, a large log, constantly carried in the boats for this purpose, was threateningly presented to its face, and of course instantly seized and beld on to for as long as it took to perform the operation of extraction. If, when the fish is quite recently dead, pressure be made on the angle of the jaw, it is easy to observe the action of the rows of teeth.

Kesala, Bantam, Java, July

HENRY O. FORBES

A Lunar Rainbow

LAST evening, September 3, at 10.40, a lunar rainbow was visible at Llanfairfechan, in a north-west direction. The arc was continuous, and of a brilliant white light. It appeared to stretch across Anglesey from Beaumaris to Puffin Island. The bow did not last more than 2' from the time it was first observed by us.

F. E. KITCHENER

Llanfairfechan, September 4

A Habit of Cattle

IN the colony of Natal the cattle have an extraordinary liking for bones. They will stand for hours with a bone in the mouth quietly munching, sucking, or perhaps more correctly speaking, levigating the bone with the tongue. I have not heard that cattle have the same habit in the other colonies of South Africa, but I have been told that cattle exhibit the same taste in some parts of South Australia.

In Natal there is, I believe, a scarcity of chalk and limestone in the geological formation. Will this fact account for the habit? Do the cattle lick bones in search of lime?

Can any of your readers account for this strange taste in cattle?

I may mention that horses and other herbivorous animals in Natal do not exhibit the same taste.

H. C. DONOVAN

Delagoa Bay, July 20

THE AUGUST PERSEIDS

THIS remarkable meteor shower recurring annually on August 10 is looked for every year with increasing diligence. To Quetelet belongs the credit of having first (in 1835) ascertained the epoch of its maximum display, though the month of August had long been known as one in which there was an abundance of falling stars. As early as 1762 Muschenbroek, in his work on "Natural Philosophy," stated that, according to his own observations, there were more shooting stars in August than at any other period of the year, and his remark is perfectly true applied to the first half of that month, though it is questionable whether the last half of August will bear comparison with that of July, when meteors fall very plentifully, and constitute a periodical display of special note on the 27th-31st. Since Quetelet determined the date of the Perseids, they have been expected every year with great interest, and from the time that Heis first began systematically to register the paths of meteors (nearly half a century ago) to the present day, observers have continued to record the successive apparitions of this prominent star-shower, so that multitudes of its meteors are now accumulated in the catalogues of British and foreign astronomers.

These Perseids appear to have belonged to our system at a very remote epoch, and to have been observed in considerable intensity as far back as the ninth century of our era. They form a continuous ring or zone of particles. The stream may vary in richness, that is to say, the particles may be very unequally distributed along the orbit, but it seems unbroken and manifests itself every year with more or less intensity from its accustomed point, yielding many bright meteors of great swiftness, and almost invariably accompanied by phosphorescent streaks. It was from careful observations of the Perseids that Schiaparelli, in 1866, was led to his theory of the connec-

tion or identity of comets and meteors, and the first orbital coincidence found was that of the Perseids with Comet III. 1862, which seems to have been merely the nucleus or condensation of the particles forming this remarkable meteor system.

The annual returns of this shower as observed and described by various observers, when compared together, show that in certain years the display is exceptionally brilliant; in others it is far less imposing. Eduard Heis, at Münster, counted 155 meteors per hour on August 10, 1863, yet on the same night in 1867 the figures had fallen to 24 per hour. He gives the following as the horary numbers derived from observations between 10h. and 12h. at several stations in Germany on August 10 in different years:—

Year.	Station.	Hourly number.	Year.	Station.	Hourly number.
1841 ...	Aachen ...	47	1863 ...	Münster ...	155
1842 ...	Aachen ...	60	1863 ...	Gaesdonck ...	215
1847 ...	Aachen ...	55	1863 ...	Peckeloh ...	109
1850 ...	Aachen ...	37	1864 ...	Gaesdonck ...	106
1852 ...	Münster ...	89	1864 ...	Rom ...	63
1853 ...	Münster ...	56	1867 ...	Münster ...	24
1858 ...	Münster ...	88	1867 ...	Peckeloh ...	39
1861 ...	Münster ...	78	1867 ...	Papenburg ...	44
1861 ...	Gaesdonck ...	102	1871 ...	Peckeloh ...	93
1861 ...	Peckeloh ...	102	1872 ...	Rom ...	64
1861 ...	Rom ...	89	1874 ...	Rom ...	110

Maximum in 1863, minimum in 1867 and 1850. There were also many Perseids in 1839, when Heis counted 160 per hour. The displays of 1863 and 1871 were of considerable intensity. On August 10, 1863, 9h. to 13^h., Heis, assisted by several other observers at Münster, registered the paths of 602 shooting stars, and at Gaesdonck on the same night, 563 were recorded between 9h. 17m. and 12h. 9m. It may be mentioned as a curious anomaly, showing how much "personal equation" may have to do with the estimation of meteor magnitudes, that at the two stations referred to, the meteors were classified as follows:—

	1st mag.	2nd mag.	3-6 mag.	Number with streaks.	Total meteors.
Münster ...	224	226	151	300	601
Gaesdonck ...	37	84	442	158	563

The Münster observers evidently overrated the magnitudes to an enormous degree.

The display of 1871, though less decided than in 1863, was still a very rich return of these meteors. On August 10 in that year, Signor Bassani, at Cosenza, in Italy, assisted by Signor Scrivani, counted 674 meteors from 9h. to 16h., and at Boston, Mass., Messrs. Sawyer and Stephens, watching the sky from 10h. to 15h. on the same night, recorded 567 meteors. Since that year the displays have not been of special brilliancy, though on August 10, 1874, 281 meteors were counted at Bristol by the writer in a watch of four hours, from 10.45, to 14.45, and on August 10, 1877, 354 meteors were seen in the five hours, from 9.30 to 14.30, giving an hourly number (for one observer) in both years of about seventy.

Dr. Phipson suggested¹ it was to be inferred from the observations that a maximum occurred at intervals of eight years. There had been considerable showers in 1839, 1847, and 1863, and he pointed out that a similar manifestation was due in 1871. In that year we had, as already described, an unusually numerous return of these meteors, and if the suspected periodicity held good, there would be another rich shower in 1879. Perhaps on that account the Perseids of the present year were anticipated with a little more than ordinary interest, but the night of August 10 was generally overcast in England (though at several stations a few meteors were discerned through breaks in the clouds), and thus the chief display has escaped us, though we may yet receive favourable reports

¹ See his "Meteors, Aerolites, and Falling Stars," p. 159.